Color Section

Color

Overview

While color can make the user interface aesthetically pleasing, the primary reason to use color in the interface is to enhance communication. The first 10-second impression of a screen conveys important information about the application. These standards and guidelines will help you avoid common problems when using color.

General Color Standards

The following color standards are to be adopted across all CDC Windows software applications and web-based surveillance applications using HTML. These standards should lead to a more consistent and usable interface.

Do not override the user's color selection.
Windows and browsers allow the user to set preferences. The user can select the color of text, and on the web, the color of hyperlinks. It is important to consider the user's color choices. The developer should never override the user preferences.

Use the standard background color of the default Windows light gray for all Windows surveillance applications
(Note: This standard applies to Windows applications only)
Use the default Windows light gray as the background color for Windows applications. Colors that provide a high contrast ensure legibility and readability. You need a 90 percent contrast difference between foreground and background in order to read text clearly. A light background with dark text is easier to read than a dark background with light text, especially for older users.

Use the standard text color of black as the primary color for text and limit use of all other text colors to no more than three when color-coding
Although our eyes can distinguish between thousands of colors, the mind can remember only a few color codes. If you are using a color other than black for

color-coding, do not attach meaning to more than three colors. Multiple colors on a screen can impede reading speed and accuracy. The more colors you use, the more distracting and less effective they are.

Use color to supplement other user feedback

Do not rely on color alone to represent any critical distinctions. Use color to supplement other techniques, such as text labels, shape, location, pattern, or sound. About 8 percent of men and .4 percent of women have trouble distinguishing red and green. Avoiding red-green distinctions removes the problem for most people. Unless all users have been screened for color weakness (blindness), you can't depend on the user's ability to see colors.

When in doubt, view the screen in gray scale. If the color values are easily distinguished in gray scale, they will be visible to people who have a problem with color blindness.

General Color Guidelines

The following guidelines have been established within the Windows user interface design community and should be applied across CDC software applications and web-based surveillance applications.

Use color to emphasize important items and focus attention

We remember what we need to pay attention to. When color is used to direct our attention to something, it helps us remember it. For example, if you have a form on one of your pages, there will probably be certain data elements that are required. A red asterisk next to each item that is required will be assist the user in immediately determining if a form has been completed to the point where saving it will not produce an error message.

Do not use colors to draw attention to unimportant or background items on the screen, such as borders between areas or page numbers.

Use color to differentiate and join

Color helps us isolate and separate different items on the screen. Use contrasting colors to emphasize difference. Use similar colors to show similarity. Items of the same color will tend to be perceptually grouped together. For example, if you are displaying a long list of test results, you may want to highlight those test results outside the normal ranges.

Use color-coding to speed up searching for information

Color-coding can reduce search time up to 80 percent when the item sought is a distinctive color. The greater the density of the display, the greater the potential of color coding to reduce search time.

For example, when showing a long list of information about people who are contacts and people who are patients, you might want to color-code the name of

the contacts one color and the name of the patients another color. This will help the user locate contacts or patients faster.

Color should support the Windows task or image of the web application
If the color is not relevant to the task, it interferes with the performance of the task. If the task or image of the web site is serious, such as a business task, use subdued colors such a gray, light blue or pale yellow. Bright, primary colors are inappropriate for a "serious" function.

Test color schemes
Color appears differently on different platforms and different monitors, and is different from print media. The user can alter both the monitor settings and the colors used by the interface. Test color schemes on several platforms and different monitors to ensure legibility on all monitors.

HTML Specific Standards

The following standards are to be adopted across all CDC web-based surveillance applications using HTML. These standards are intended to lead to a more consistent and usable interface.

Use the standard background color of white for all Web-based surveillance applications
No browser-safe grays provide high enough contrast to ensure legibility and readability. Therefore, a white background color for all Web-based surveillance applications should be used.

Use the standard text color of black as the primary color for text and limit use of all other text colors to no more than six when color-coding (including link colors)
Although our eyes can distinguish between thousands of colors, the mind can remember only a few color codes. If you are using a color other than black for color-coding, do not attach meaning to more than six colors (including link colors defined in the standard below). Multiple colors on a screen can impede reading speed and accuracy. The more colors you use, the more distracting and less effective they are.

Use the default link, active link and visited link colors on the Web.
The standard web interface displays hypertext links to other pages in colors that stand out from the rest of the text. In addition, different colors are used to show which links have been visited and which have not. There is a good reason for leaving links in their default colors. Your visitors will have seen hundreds of pages with links in their default colors and will take advantage of this conditioning by being able to navigate a new site without having to constantly relearn the interface.

Use browser-safe colors for all text and flat areas of color on the Web.
Always specify colors in HTML that are browser-safe. See the *More About Color* section for more information.

Use hex values only for all text and flat areas of color on the Web.
Always specify colors in HTML by their hex value. See the *More About Color* section for more information

HTML Specific Guidelines

For web based applications using HTML, the following guidelines are recommended and should be applied across CDC web-based applications using HTML.

Color used in graphics or in tables should not compete with text
If you use background color in a table or a background graphic, make sure the colors do not compete with the text. Test graphics and backgrounds on a variety of monitors. A subtle color graphic or background on one monitor may render the text unreadable on another monitor.

More About Color

Color calibration
Monitors are not calibrated accurately to one another. Shades of color can vary widely from computer to computer, platform to platform, television to television, and even between identical operating systems and hardware. Gamma differences amplify the calibration problem. Gamma dictates the brightness and contrast of the monitor.

You have no control over the monitors your user interface will be viewed on. Therefore, the colors you pick, and the value of those colors are important.

Color value and contrast
Value is the display of lights and darks in an image. Contrast is the difference in values that renders text and images to be seen easily. Make sure your images have a good range from black to white. A way to test values and contrast is to change your monitor to grayscale mode, converting the color data to blacks, whites and grays. If the grayscale version is legible, then the image will be legible on most monitors.

Browser-safe colors
Different operating systems come with a standard 8-bit palette (256 colors) that the browser uses to display colors. However each system reserves 40 of those colors for its own use, resulting in 216 colors that are common across operating systems and are therefore referred to as browser safe. If you create an image or use text that with colors that are not browser safe colors, the colors will appear as many multicolored pixels

approximating the original color. This is called dithering. Lynda Weinman provides a free, downloadable browser safe palette at http://www.lynda.com.

The color of a pixel is made up of three projected colors of light that mix together optically. These lights form the colors red, green, and blue and are referred to as RGB colors. On the computer screen and the television screen, color is expressed numerically in terms of RGB values, with three digits representing each color, ranging from 000 to 255.

In HTML, color is either specified in RGB values converted to hexadecimal or as color names. The hex values of colors in a browser-safe palette are formed of variations of only 6 values shown in the table titled *Browser-Safe ColorHex Values*.

Browser-Safe Color Hex Values

Hex	00	33	66	99	CC	FF

The table titled *Some Browser-Safe Colors* shows some common browser-safe colors and their hex values.

Some Browser-Safe Colors

Color	**Hexadecimal Value**
Black	000000
Dark Blue	003366
Dark Gray	666666
Dark Green	336633
Dark Red	660000
Dark Yellow	FFFF00
Light Blue	CCFFFF
Light Gray	CCCCCC
Light Green	CCFFCC
Light Red	FF6666
Light Yellow	FFFF66
Medium Blue	0000FF
Medium Gray	999999
Medium Green	00FF00
Medium Red	FF0000
Medium Yellow	FFCC66
White	FFFFFF

Recommended Readings

Horton, William K. *Designing & Writing Online Documentation*. John Wiley & Sons, 1990

Weinman, Lynda, <*preparing web graphics*>. New Riders Publishing, 1997

Helpful Web Sites

The Microsoft Developers Network Online Library of Books, specifically the online version of *The Windows Interface Guidelines for Software Design* http://msdn.microsoft.com/isapi/msdnlib.idc?theURL=/library/books/winguide/PLATFRM2/D5/S115B5.HTM

The Web Reviews online publication. Contains great in-depth articles on every aspect of web site authoring. http://www.webreview.com/wr/pub

Lynda Weinman is a recognized expert on graphics and color on the web. Her web site includes browser-safe color palettes, RGB values for web-safe colors, information about her books and links to other color-related web sites. www.lynda.com